AIR FORCE ACADEMY

FIRE DEPARTMENT

STANDARD OF RESPONSE COVERAGE

2000

MISSION

The mission of the U.S. Air Force Academy Fire Department is to provide programs designed to protect the lives and property of the inhabitants and visitors of the USAF Academy from the adverse effects of fires, medical emergencies, and exposure to hazardous conditions created by either man or nature.

ORGANIZATIONAL PRINCIPLES

- *Support a safe, healthy and diverse workplace*
- *Establish and maintain the highest quality fire suppression program*
- *Establish a strong community relations program, particularly in the area of fire prevention and public education*
- *Promote lifelong learning with an emphasis for high professional standards and higher education*

INTRODUCTION

The Air Force Academy has a population of 13,441 and covers 18,455 acres of land. We responded to 1,071 emergencies, including 27 fires and 310 medical calls, in 1999. The Fire Department provides 24-hour emergency services to Air Force Academy personnel and property. The Fire Chief is responsible for the overall administration of the Academy Fire Department. The annual operating budget for the Department in 1999 was $208,000.

The Fire Department is staffed by trained fire protection personnel and is organized into four major elements, Operations, Prevention, Training and Safety.

There are 41 civil service (GS-081) and 28 military fire fighters assigned, staffing is based upon Air Force Manpower Standard 44EF, *Fire Protection Flight*. Fire fighters are expected to perform at the Fire Fighter II, Hazardous Materials Operations and Airport Firefighter level as a minimum. Fire fighters respond to a variety of different incidents, to include Aircraft Rescue Fire Fighting (ARFF), structural fire operations, rescue operations, hazardous materials incidents, and emergency medical services.

Utilizing vehicular assets and installed supportable systems, our fire fighters control, neutralize, mitigate, and/or extinguish any fire or emergency situation occurring within the Academy's boundaries. Assistance from other agencies may be necessary to successfully mitigate some incidents. Fire fighters also perform limited containment and control measures at hazardous materials incidents. Mutual aid or emergency contract authority may be requested for incidents beyond the capabilities of this department.

We provide first responder emergency medical assistance under the supervision of the Academy Hospital. The Air Force Academy Fire Department does not provide ambulance transport; a contract ambulance company provides that service. In addition, the Enhanced 911 (E-911) Communications Center serves as Public Safety Answering Point for 9-1-1 calls and is the interface between the Law Enforcement Desk and the Academy Hospital. Medical assistance may require rescue, extrication, or fire fighting actions to be carried out simultaneously to ensure the best possible assistance to the victim(s).

All Fire Department members work together to provide fire prevention inspections of the installation and to educate the members of the community in sound fire prevention practices. In addition, the Assistant Chief for Fire Prevention performs technical reviews of building renovations and construction projects.

There are 3 fire stations operating on the Academy. Fire stations one and two house an engine company with a 1000 GPM pumper. Station 2 also has a ladder company, while station 3 staffs an ARFF vehicle and a 1250 GPM

engine/squad. The concept of the engine/squad at the Air Force Academy is to provide suppression and specialized rescue services with one vehicle. There is a complete inventory of specialized tools and equipment that is maintained on each vehicle. Although optimum daily staffing for the Air Force Academy Fire Department is 18 fire fighters, military deployments during approximately 8 months of the year provides for a minimum staffing of 14 fire fighters on duty (plus the Assistant Chief).

Minimum proficiency training subjects and frequencies are specified in Air Force Instruction 32-2001, *Fire Protection Operations and Fire Prevention Program*. Qualified persons provide all training and education. All exercises are conducted within the established standard operating procedures, are supervised by qualified instructors, and have a designated safety officer for all evolutions. All fire fighters maintain current certification in self-contained breathing apparatus, Cardiopulmonary Resuscitation, EMS First Responder/Emergency Medical Technician (when designated in writing by the fire chief), and Hazardous Materials Operations level. We maintain several specialized teams to include a wildfire response team, dive rescue, and a high angle rescue team. Members of each team receive specialized training of at least 24 hours annually.

TIME POINTS AND TIME INTERVALS

All emergency events follow a specific series of events. Emergency systems primarily intercede after the "point of awareness" of the emergency event. An emergency response time continuum is composed of the following time points and intervals for all emergencies:

Event Initiation:

The event initiation occurs when factors combine to ultimately result in the activation of an emergency response system. Precipitating factors can occur

seconds, minutes, hours or even days before a point of awareness is reached. An example is the patient who ignores chest discomfort for days until it reaches a critical point at which he or she makes the decision to seek assistance (point of awareness). It is rarely possible to quantify the point at which event initiation occurs.

Emergency Event:

The emergency event begins at the point when the need for an emergency response system is identified. These identifiers may include an individual that recognizes or witnesses a need for an emergency response or an electrical or mechanical system such as a smoke or heat detector.

Alarm:

An alarm begins when the emergency response system is activated. An example is when 911 is initiated by someone in need or when a local or central alarm is transmitted to a receiving agency.

Notification:

Notification begins when the Fire Department dispatcher receives the call or alarm.

Alarm Processing:

Alarm processing is defined as the interval of time between the notification of alarm to the Fire Department dispatcher and the receipt of the alarm by the emergency responders. This is the first point at which the actual recording of time begins in the response time continuum. The Commission on Fire Accreditation International (CFAI) benchmark is 50 seconds.

Turnout Time:

Turnout or "prep time" is from when the alert tones sound in the stations until units indicate they are responding to the call. The CFAI benchmark for this time is 60 seconds. Company officers are instructed to establish this point by signing out "in-service" as the vehicle turns a wheel in transit to an emergency incident.

Travel Time:

This is the point at which the units indicate they are responding to the call until they indicate arrival at the scene of the emergency ("on-scene"). Travel time is affected by the location of the emergency equipment within the Academy. Factors that affect travel time include weather, traffic and time of day.

On-Scene Time:

On-scene time is the point at which the responding unit arrives at the emergency and ends the recording of the total response time.

Initiation of Action:

This is the point at which operations to mitigate the incident begins. Actions may include size-up, resource deployment or when patient contact is initiated.

Termination of Incident:

Termination is the time at which the emergency units have completed the assignment and are available to respond to another request for service or the "available" time.

Total Response Time:

Total response time is calculated from the notification point until the units arrive on-scene.

Elements of Response Time

The recommendation for response time is based on examples provided in the CFAI handbook. This information suggests that intervention at a structure fire prior to the flashover stage is crucial. Smoke alarm activation or awareness of a fire in progress does not occur until approximately 18-20 minutes after initiation of the event. From this point of awareness and time until notification occurs, conditions deteriorate rapidly with maximum temperatures and flashover occurring within an 8-10 minute time frame. Flashover is that point of a fire's growth at which there is a significant shift in its threat to life and property. From an emergency medical perspective, the six-minute time frame is used as a means of service level measurement. Brain damage is very likely in cardiac arrest patients after six minutes without oxygen flow to the brain. The CFAI handbook also refers to a ten-minute time frame in which external defibrillation provides for the greatest chance of survival.

COVERAGE ZONES

In order to provide adequate coverage and response times for the entire Academy, we have established 5 fire management areas. The Air Force Academy is comprised of over 18,000 acres, but only 3,000 acres are developed in five distinct areas. They are:

Zone #1 - Cadet Area

Zone #2 – Service and Supply Area

Zone #3 – Community Center Area

Zone #4 – Pine Valley Housing

Zone #5 – Douglass Valley Housing Area

In addition, the Air Force Academy is divided into three fire protection districts:

District 1 - Fire Demand Zones 3 & 4

District 2 - Fire Demand Zones 1 & 5

District 3 - Fire Demand Zone 2

Distribution of Vehicles:

The fire stations and resources are located to assure a rapid deployment to minimize and terminate emergencies and are our primary measurement to evaluate distribution is first-due engine travel times. Proper distribution is necessary to ensure that first-due emergency vehicles arrive promptly and are able to mitigate or contain any emergency.

Fire Flow

Fire flow must be addressed when considering risk factors. Fire flow is an assessment of water supply needed once a structure has become fully involved. This assessment is based on defining the problem that will occur if the structure is totally involved, thereby creating the maximum demand upon fire suppression services. Mil-Handbook 1008, *Fire Protection for Facilities Engineering Design and Construction*, requires fire flow calculations be included with all plan review documents. The Utilities Section of the 10th Civil Engineer Squadron maintains the water supply system and performs fire flow testing on our fire hydrants.

The water supply system is tested for fire flow and a comparison of available hydrant flow to the required fire flow is required with every new project at the *Findings and Recommendations* stage of the design analysis.

We are required to utilize the following standards in establishing minimum fire flow requirements:

- Interior firefighting (offensive operations)

  250 GPM from each on-scene company (NFPA)

- Master streams

  Minimum of 500 GPM (NFPA)

- Hand lines

  Maximum of 300 GPM (NFPA)

- One- and Two-family dwellings

  Minimum 500 GPM (NFPA)

STANDARD OF COVERAGE FOR THE ACADEMY

The Academy Fire Department is an aggressive, full service fire department. A first due company shall be able to provide a safe interior attack at a structure fire or basic life support at a medical call. Our non-fire responses are primarily emergency medical calls. For the calendar year of 1999, 310 (or 29%) of the 1,071 emergencies we responded to were medical calls**.**

Response Times

The Academy Fire Department response times are listed below:

	Goal	AFA Average
Alarm processing time	:50	:23
Turnout time	1:00	1:04
Travel time	5:00*	4:06
Total response time	6:50	5:24

(The AFA average represents actual times for E-9 during the first three quarters of calendar year 2000. While the average times are provided here, fractional times are used in the evaluation of our program)

* Travel Time goals will vary, based on the risk presented. Our goal is to meet these times during 90% of our responses:

- For *maximum risks*, a goal of a 5-minute response time is established (these risks include warehouses, hangars, hospitals and industrial buildings).
- For *significant risks*, a goal of a 7-minute response time is established (these risks include administrative, commissary, dining halls, and dormitories).
- For *moderate risks*, a goal of a 9-minute response time is established (these risks include family housing units).
- For *low risks*, a goal of a 15-minute response time is established (these risks include isolated buildings).
- In addition, the Academy fire department is required to respond to announced aircraft emergencies within 1 minute, and unannounced emergencies within 3 minutes.

Each of the facilities on the Academy has been analyzed to ensure we meet our response times to each type of occupancy regardless of the fire district. The level of risk for all facilities is maintained in the Risk Hazard and Value Evaluation (RHAVE) software database. Other fire (non-structural) risks were also evaluated and were critical in the development of this document.

Staffing Levels:

Staffing levels will determine the number of personnel available at an emergency scene. Their positions, training specialties and experience level are considered when determining which personnel are assigned to accomplish tasks at an emergency. We have determined that the following types of emergencies require a minimum amount of personnel to ensure a safe and effective outcome.

Structural Responses:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Providing Water Supply	1
Pump Operations	1
Forcible Entry	2

Fire Attack	2
Search and Rescue	2
Ventilation	2
Overhaul	2
Ladder Placement	2
Rapid Intervention-Safety Team	2

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

NOTE 2: Initial response to "Maximum" or "Significant" hazards includes a senior fire official and two engine companies and a ladder company (or three engine companies). For "Typical" or "Remote" hazards, the initial response will require a senior fire official and a single engine company.

Medical Responses:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Patient Assessment	1
Patient Treatment	1
Extrication	2
Immobilization	3 Per Victim
Litter / Gurney Carry	2 Per Victim

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

NOTE 2: Initial response will require a senior fire official and a single engine company.

Aircraft Emergencies:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Aircraft fire fighting	3
Rescue of crew members	2

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

Note 2: Initial response to an aircraft emergency on the Air Force Academy is the ARFF vehicle and a senior fire official.

Note 3: Rescue of crewmembers will have to be performed by a secondary responding crew.

Hazardous Materials Incidents:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Providing Water Supply	1
Hose Deployment	1
Product Identification	2
Product Control	2
Product Neutralization	2
Decontamination	1
Rapid Intervention-Safety Team	2

NOTE 1: The fire department's role is to provide command and control, rescue, extinguishment, and containment actions. Neutralization, recovery, clean up and disposition of the chemical is not a fire department function. The fire department may be required in a support role during these functions.

NOTE 2: Any or all of these functions may have to be performed simultaneously to be effective.

NOTE 3: Initial response to "Maximum" or "Significant" hazards includes a senior fire official and two engine companies and a ladder company (or three engine companies). For "Typical" or "Remote" hazards, the initial response will require a senior fire official and a single engine company. The Fire Department is not equipped to handle all hazardous materials incidents. Any incident outside the capability of this department shall warrant a request for assistance from the El Paso County Sheriff's Department or the Colorado Springs Fire Department.

Wildland Fire:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Providing Water Supply	1
Fire Attack	2
Overhaul	1

NOTE: Initial response required for wildland fire incidents include a senior fire official and either two brush trucks or an engine company.

Miscellaneous Responses:

FUNCTION	MINIMUM PERSONNEL REQUIRED
Incident Management	1
Providing Water Supply	1
Pump Operations	1
Fire Attack	2
Overhaul	3

NOTE 1: Any or all of these functions may have to be performed simultaneously to be effective.

NOTE 2: Initial response to "Maximum" or "Significant" hazards includes a senior fire official and two engine companies and a ladder company (or three engine companies). For "Typical" or "Remote" hazards, the initial response will require a senior fire official and a single engine company.

Miscellaneous Rescue Situations: The Air Force Academy Fire Department will provide technical rescue during non-fire situations. Examples of technical rescues include high and low angle rescue, trench rescue, confined space rescue, and underwater dive rescue. These situations are extremely specialized in nature, and staffing will be provided in accordance with nationally recognized standards, and are outlined in the Air Force Academy Fire Department Standard Operating Procedures. Initial response to these situations will be a single engine company and a senior fire official.

Progression of Emergency Situations. It is recognized that not all emergencies will be handled by the initial response force. Specifically, a major wildfire on the Air Force Academy will quickly deplete our resources. During situations that exceed the capabilities of the first due apparatus, the SFO will call for additional resources, first from within the Air Force Academy Fire Department through the recall of off-duty personnel, then from the mutual aid agreements that are in effect. Requests for outside assistance will be made by the SFO, and briefed to the installation commander.

Company Performance Standards. To determine the necessary standard of coverage, our department had to first determine the times for on-scene performance of minimum company standards to mitigate fire emergencies. After arriving at the scene it is necessary to know that we can initiate operations to mitigate the incident in a timely fashion. The minimum company standards are performance indicators for specific offensive and defensive tactics to extinguish a fire. Each standard requires a certain type of hose evolution necessary to combat specific fire situations. Mitigation of a fire emergency is based upon recommended maximum times for fire ground evolutions as established by NFPA 1410, current edition. All companies are evaluated annually and are required to complete the evolution assigned within the maximum allowed time frame. Time frames range as follows (NFPA STD) and our fire department standards (AFAFD):

	NFPA STD	AFAFD
Forward lay 1 pre-connect, 1 back up line[1]	3:00	2:48
Reverse lay 1 pre-connect, 1 back up line[2]	4:00	3:18
Double reverse from monitor to hydrant[3]	5:00	4:00
Double reverse from standpipe to hydrant[4]	3:30	3:01
Reverse lay from elevated master stream (Truck)[5]	4:00	3:42

[1] NFPA Standard 1410, A-4-1.1a
[2] NFPA Standard 1410, A-4-1.1b
[3] NFPA Standard 1410, A-5-1.1a
[4] NFPA Standard 1410, A-6-1-1a
[5] NFPA Standard 1410, A-5-1.1c